Fifty Years Hence:

OR

WHAT MAY BE IN 1943:

A PROPHECY SUPPOSED TO BE BASED ON SCIENTIFIC DEDUCTIONS BY AN IMPROVED GRAPHICAL METHOD.

BY

ROBERT GRIMSHAW.

NEW YORK
PRACTICAL PUBLISHING CO.
21 PARK ROW
1892

COPYRIGHT, 1892,
BY
ROBERT GRIMSHAW.

UTOPIA
RBR
1865

To

MY CHILDREN,

Who may perchance, fifty years hence, compare these prophecies with what has then come about.

FIFTY YEARS HENCE.

FIFTY YEARS HENCE.

"Yet I doubt not through the ages one increasing purpose runs,
And the thoughts of men are widened with the process of the suns."
—*Locksley Hall.*

That portion of the public which honors me by perusing what I have been fortunate enough to learn concerning the future of the inhabitants of this planet, half a century from this Christmas of 1892, will naturally, as my name is unknown to either fame or science, wonder on what grounds I presume on so bold an undertaking; perhaps what manner of man I might be.

But when I positively disclaim any merit or virtue as a prophet, and state that I am merely by chance the medium by which a portion of the veil is torn from the future, it is enough that I describe myself, as referred to in sundry recitals, as Francis Ainsworth, of the City and County of New York. Perhaps I might add that I am by choice an electrician, by birth a Pennsylvanian, in age twenty-one, and by no fault of

my own still unmarried. For some years I have been endeavoring to save enough to enable me to marry my lifelong friend Estelle Morton, of Philadelphia; but as I have a family of small sisters to support out of my salary and what I can earn by extra work, the period of our engagement has been prolonged beyond the time of even our least sanguine calculations. Nearly all my evenings are spent at home, within the sound of the Jefferson Market clock; for I have chosen the Ninth Ward because it is even yet an American stronghold, because it is convenient to my place of business, and because it is better than it looks, which is preferable to looking better than facts warrant.

Once a month, however, I am sure to be at the meeting of my Masonic lodge in the Temple, at Twenty-third Street; for I feel that there I am in contact with both the living present and the dead past; and the Mystic Tie seems well worth critical study.

One evening as I was about to enter the side portal on the Avenue, a ragged newsboy offered, at more than the regular price, some "extras" containing an account of some great financial upheaval in Europe. The man by my side ob-

jected to paying an exorbitant price for the hastily-issued and noisily-cried sheet, saying to his companion: "Now, if he would bring me to-morrow's news, Trask, I wouldn't mind paying a good round sum for it." The auburn-haired Past Master, who is seamed with the scars of battle in "The Street," replied, more in earnest than in jest: "I would readily pay a thousand dollars for a knowledge for what will happen to-morrow, and a million if it were exclusive." "On that basis," said a man ahead, who was just stepping into the elevator, "what would it be worth to know what is to happen fifty years hence?" "Oh," said Trask, "I suppose it would be reasonably safe to offer any price at all for the performance of an impossibility; and for that matter, any one impossibility is just as unreasonable to ask as any other. It's hard enough to be sure of what happened fifty years ago, let alone diving into the news of fifty years hence."

"It is not so impossible as you think," quietly remarked a gentleman at my side, who seemed a stranger to all of the rest. "It can be done, if one has patience, judgment, time and means."

As we meet all sorts of people in the world

at large, it is not unreasonable to expect a fair variety among Free Masons, who, while held to a uniform belief in certain things, and to unvarying actions in others, have the freest living, compatible with a charitable and upright walk, in all others; consequently, even so radical a remark as that, and even one so gravely uttered, exacted no comment, and scarcely a glance from any, other than one of courteous recognition that the speaker had addressed his companions.

He was a distinguished looking man, even in a Masonic temple, where men of commanding presence, men of dignified bearing, men of venerable appearance and men of philosophical habit, are by no means uncommon. Although but of medium height, his carriage was such as to give him the appearance of a tall man. His eyes were dark, full, luminous, and wide apart; the nose strong, straight and with large nostrils; the mouth small, firm and flexible. A still luxuriant head of wavy white hair, long white mustaches, and beard falling full and untrimmed upon his breast, imparted a distinguished and venerable appearance. His erect form was slender although evidently well-

muscled, even at his age, which seemed seventy or thereabouts. His dress was neat and inconspicuous; the materials evidently of excellent quality, although of a fashion long gone out of date.

We entered the lodge-room almost together, and like myself, he took a seat near the door.

* * * * * * *

To the work for this evening there was lent unusual interest by the presence of a Masonic celebrity, revered in two hemispheres, who had been invited to give us the benefit of the stores of learning for the possession of which he was noted, and of the wise counsel which he ever gave to those younger and less well informed in Masonic matters.

The eloquent speaker having held us spell-bound by his masterful presentation of the teachings of symbolic Masonry, in a flight of oratory carried us back to the days and works of Solomon the King, of Hiram Abiff, and of that other Hiram, King of Tyre; and in the first great Temple which those early Master Masons builded twenty-nine centuries previously, traced for us, in form, size and position of timber and metal—in tool, and time, and work, noble les-

sons of manhood and virtue; of brotherhood and helpfulness; of contemplation and self-restraint, until each one addressed felt that he, too, was proud of being a Free and Accepted Master Mason, and emulous of being a credit to his ancient craft.

In the building of that majestic, beauteous, mystic Temple,

> "No hammers fell, no ponderous axes rung;
> Like some tall palm the mystic fabric sprung
> Majestic silence."

His descriptive powers, his witching imageries, held us spell bound. But at one point the speaker paused, saying that here there seemed to be something well worth knowing, but which the centuries had hidden. It was evidently replete with symbolism of highest order; but the key to its mysteries was unfortunately lost. Some day, perhaps, the light of investigation might penetrate the gloom in which the mystery was enwrapped—if, indeed, those better versed in the craft had not already solved the interesting problem.

The point referred to was one of those in which occult ratio and mystic beauty of proportion unfold on every hand new virtuous teach-

ings. It was so rich in reminder and suggestion, no matter from what side viewed, that its consideration roused the enthusiasm of all hearers.

When the speaker ceased, the quiet little gentleman next me seemed as one filled with inspiration.

> "... With grave
> Aspect he rose, and in his rising seemed
> A pillar of state; deep on his front engraven
> Deliberation sat."

In a well-modulated voice which had evidently been one of great power and beauty, he asked permission to endeavor to cast some light, however feeble, upon so interesting a subject. Something in the quiet dignity of his bearing, in the classic precision of his diction, and the graceful modulation of his voice, attracted all with more than usual force to the new speaker.

> "... his look
> Drew audience and attention still as night
> Or Summer's noontide air."

He said that in order to find the fullest measure of symbolism in this, as in other Temple mysteries, we must go further than the Temple walls and question the inner chambers of the pyramids—we must ask of the Shepherd Kings

what Solomon and the two Hirams told them not. The point was beautifully elucidated both in itself and in its relation to others, so that its increased richness of allusion and teaching became at once surprisingly manifest.

Evidently all present felt that a master of the mysteries of the buried centuries was among us —and in gesture and expression all asked "the old man eloquent" to continue, and to give his views upon the work of those Shepherd Kings to whom he had so appositely alluded.

So far as I can remember the facts which he laid before us, and fill up gaps in my memory, by reference to standard authorities, he spoke as follows:—

"The Hykshos or Shepherd Kings came suddenly into this land of mystery; came with a purpose, which purpose accomplished, they departed speedily. That purpose, for which they travelled so far, was to build the great pyramid, a unique, symbolic, and prophetic structure, 'star-y-pointing,' raised on a site chosen from the whole surface of the earth by reason of its unique, its solitary fitness. That building, type of the ever-during gates of heaven, wonderfully symbolized the mystic wisdom of its time; im-

perishably recorded the principal facts in metrology, meteorology and astronomy, and prophetically embodied the discoveries of ages then to come. Temple and town have gone to the ground, but it has endured. It was the precursor of the great symbolic Temple of Solomon, built by the descendants of those shepherd builders, students of the heaven's wide pathless way, and which although destroyed, could be reconstructed by the measures and dimensions familiar to our mystic craft, and recorded in that great book of symbols, the Bible.

"Now, the dimensions and rhythmic proportions on which Solomon, on which Hiram, King of Tyre, and on which Hiram Abiff builded the wondrous Temple, were enshrined in the Great Pyramid just five hundred years before.

"The Temple diagram, conceived under the starry cope of heaven, is made by drawing on a diameter of 1,000 inches, a circle, about which and in which is described a square, again a circle and a square circumscribed. The areas of the various squares and circles here drawn, equal those of the porch of Solomon's Temple (125,000 square inches), of the holy place (500,000 square inches) and the Holy of Holies; the

latter of which is encircled in a nest of circles and squares and the original radius of which, five hundred inches, was the whole length of the Holy of Holies itself.

"Now let us retrace our steps through five centuries and enter the great monument of Chem, to obey the prophetic mandate of the angel to the holy St. John, and 'arise and measure the temple and its altar.'

"In the king's chamber the volume of a certain portion of the room equals fifty times that of the coffer—the relation of the ark to the brazen sea in the Temple. Drawing the diagram of the pyramid to a scale having as the height, the mean height of the king's chamber (232.52 inches), the magistral line is 412.13 inches, or the length of the chambers. The base of the triangle is the number of days in a year, 365.24 inches, and the radius of that circle having an area of 365.24 inches squared, is 206.06 inches, or the width of the chamber. Constructing a pyramid triangle of height equal to the width of the chamber, the magistral line of the completed pyramid is the year number 365.24 inches —the perimeter of the base, double the two other important chamber dimensions — the

length, 412.13 inches, and the second height, 235.24 inches. The entire pyramid design comports with that of the chamber, and those of the coffer and of the ante-chamber, which is in fact the ante-chamber to modern civilization.

"Leave the great step at the southern end of the Grand Gallery—a yard high and a yard plus a cubit wide—and we find stretching across the ante-chamber a granite leaf, of two blocks slid in vertical grooves. On the upper of these blocks is the only ornament in the pyramid—a boss, nearly semicircular in face—exactly an inch high and an inch in westerly displacement from the centre of the leaf. The cubic contents of this inch-high boss are one pint. Its volume of water weighs just one pound. The inch, the pint, the pound, so often changed, so often lost; restored by one method and verified after such restoration, by the boss on the leaf which bars the way in the ante-chamber! The base of the boss is a chord of five inches or a span; its centre one sacred cubit or five spans from the hidden end of the leaf. The top block, apparently irregular in upper outline, is 41.2 inches long, 15.7 wide, and 48.57 in mean height, giving a contents in cubic inches of

31,415.9+, which contains the relation between the diameter and the circumference of a circle. The lower block has a contents of exactly one-fourth of the coffer, or an Anglo-Saxon 'quarter'. On this leaf, by reference to the boss, we find also recorded or prophesied the twenty-four inch gauge and the three-foot rule, as well as that sacred cubit of twenty-five inches, which is commensurable with the polar diameter of the earth.

"The base of the boss is five, the central one of the nine digits, a number so hated by the Egyptians, even of the present day, as to be marked by them with a 0 on their watches—but the sacred number of the Shepherd Kings, who embodied it in the five-sided, five-angled, five-proportioned monument which they came so far to build, and which was the key to the proportions and dimensions of that Temple in which the five books of Moses were sacred to a people who left the land of their oppressors, five abreast, 'with high hands,' with outspread fingers, flaunting their number in the faces of the Egyptians, to whom it brought so much bad luck.

"From the Pentalpha or five-pointed star may

be reproduced the pyramid and the Temple proportions and those of the perfect human body—for this being inscribed in a circle, the centre of the star and circle being at the pubis, the arms and legs spread out easily just reach the points of the star—the centre of the breast being midway from the pubis to the crown of the head, and the base of the knee-cap midway from the pubis to the sole of the foot. The pyramid diagram gives the correct proportions of the human body with equal exactness and detail."

I felt attracted to this man who drew so freely from an apparently inexhaustible mental storehouse, and who so logically connected facts as to weave from mere numbers so wondrous a fabric; but I dared not intrude my callow personality upon one so well-rounded. As we went down the smooth stone steps, his foot slipped, and he would have fallen headlong had I not been fortunate enough to catch and support him. Even as it was, he wrenched his foot, so that he gladly accepted my proffered assistance to his car.

It turned out that he, too, went down town, although further than I; and we entered the same surface car. He honored me by a request for

an exchange of cards; and on the one which he handed me I read the name "Roger Brathwaite"; no address being given, although I learned from him that he resided in one of those old wards, once fashionable, where still a few old-fashioned people of means live in commodious old dwellings, and refuse to be crowded out by factory and warehouse, be they never so lofty and noisy by day, never so lonely and gloomy by night.

Some three weeks later, I met Brathwaite in the street, and in walking with him, for a few blocks, learned that he had been a friend of my grandfather—whose name I bore in full. He told me that he had been inquiring concerning me, of my employers, and of others; and that he had had such good reports that he wished me to call upon him the next afternoon, at the address which he now gave, and where, he remarked, he wished to make a business proposition which might be to my advantage.

It is needless to say that before the hour appointed, I bent my steps towards the place of meeting.

The house was one of those ugly comfortable-looking four-story and basement brick struct-

ures, with generous doors and wide and abundant windows, which the wealthy New Yorker of three generations ago, be he merchant prince or landed proprietor, built for himself and intended for his descendants, but which have been crowded out of notice by towering factories, storehouses and tenement buildings. Its wide granite steps and curiously-wrought iron railings, its great doorway, upheld by pairs of fluted pillars enclosing narrow lights at each side of the silver-handled single door, and capped by a semi-circular transom, whispered of the quiet dignified early days of the century; while the puffing of the exhaust steam across the way, and the snarling and buzzing of the machinery in the piano factory next door, spoke of its noisy and commonplace close.

Musk-rose and woodbine formerly luxuriated in its garden; star-proof elms once threw blue-tinted moonlight shadows on its now-mellowing walls; and high-bred dames once trod with dainty feet its smooth and polished floors. The glory of the neighborhood, like that of Ichabod, had departed—but the scrupulous neatness of the old mansion stood out among the dirt and squalor of its surroundings.

In response to my ring, the door was opened by a grave and quiet maid-servant of the olden school; capped, aproned and slippered, with gray hairs thickly sprinkling the brown. On learning my name she directed me to ascend to the study in the fourth story, where I would have no difficulty in finding the master of the house.

As I passed up the wide staircase trod by so many feet now motionless, I could see through the open doors, as well as in all the halls, shelves upon shelves of closely-packed books, and long tables and racks in great numbers, laden with what seemed maps and charts of nothing in particular, or things in general. It was evident, however, that whatever archives these were, they were numerous, well arranged, and of great diversity of age and subject.

The fourth story reached, I found myself in a great loft-like apartment, covering nearly the entire floor, and filled, like those below it, with book-laden cases, and tables thickly strewn with charts and great portfolios.

My host received me with the grave sweet courtesy which sat so well upon him, and begged me to permit him for a few moments to

put the finishing touches upon a piece of work, before entering upon the matter concerning which he had, as he put it, done himself the honor to ask me to confer with him.

"While I complete my work," said he, "look about you. Note well my friends of all ages, in whose company I have passed many busy years. They are 'the abstracts and brief chronicles of the time.' Around them, with tendrils strong as flesh and blood, my pastime and my happiness have grown. Milton said: 'A good book is the precious life-blood of a master spirit embalmed and treasured up on purpose to a life beyond life,' and I have found it so. Browning wrote—and mark well that a hidden import lies in his words:

"'Books are men of higher stature,
And the only men who speak aloud for future times to hear.'"

I availed myself of the opportunity to look about me, and as the charts seemed but a meaningless tangle of long and short lines of black and the three primary colors, parallel and interlacing, I betook myself to an inspection of the book-shelves, each plainly lettered with the class of its contents. I could see that the works

here were mainly historical, and arranged in divisions corresponding to periods and epochs in the world's history.

Here for instance in the section of Modern History, and in that division devoted to the Formation of Distinct Nationalities were Longman's "Lectures on English History," Michelet's "History of France," Brougham's "England and France Under the House of Lancaster," Edgar's "Wars of the Roses," Kirk's "Charles the Bold," and scores of other histories proper, to say nothing of Botta's "Dante," Campbell's "Life of Petrarch," and similar works throwing light on men and manners between 1300 and 1490 A. D. The shelves belonging to "The Age of the Great Discoveries" were loaded with Major's "Life of Prince Henry of Portugal," Irving's "Life and Voyages of Columbus," and "Voyages and Discoveries of the Companions of Columbus," Prescott's "Ferdinand and Isabella," Ranke's and D'Aubigné's histories of the Reformation, Prescott's "Conquests of Mexico and Peru," and all those other standards which tell of men and events from 1490 to 1530. The system was perfect; the manner in which it was carried out, wonderful.

I had no time to observe more, for Brathwaite having completed some careful plotting upon a chart which covered a long table, rose and led me to a seat near his desk, where, his earnest eyes gleaming with a strange sense of power, his rich voice vibrant with magnetism, he thus addressed me:—

"The other evening you heard the comments of our brethren as to the great money value of a knowledge of the near future; but not one word was said as to what an incalculable boon to the human race would be the revelation of the general condition of men, morals, law, liberty, and all things great and small, at each decade yet to come. You may have heard me remark, almost unconsciously, that such knowledge of the future was not so impossible as one might think; and the exclamation may have impressed you, if at all, with an idea of the mental irresponsibility of the one who uttered it. But I think that I can convince you, who are the first to whom I have addressed myself on the subject save my dear wife—now gone before me—that my remark was not only compatible with the soundest mental powers, but warranted by a degree of special study and training,

a duration of special application, far beyond the usual.

"I was long ago impressed with the idea that many of those long-past occurrences about which learned historians disagree, could be cleared up by the light of induction; that as like causes have ever produced like effects, any causes, however remote in time, might be deduced from their effects, if only the records were sufficiently full and accurate, and the method sufficiently philosophical and thorough. It seemed, for instance, unreasonable that so great discrepancies should exist as to names and arrangements of rulers, and commencement and duration of dynasties, of those very Hykshos, or Shepherd Kings, of whom I spoke the other night in those sacred precincts. Manetho (according to Josephus), states that they reigned five hundred and eleven years, but cites only reigns amounting to two hundred and sixty years; while Africanus makes the duration of those reigns two hundred and eighty-four years, and Eusebius one hundred and three. Africanus makes the Shepherds consist of the fifteenth, sixteenth and seventeenth dynasties, and to have ruled nine hundred and fifty-three years,

but gives the names and reigns of only one, which he calls the fifteenth, while Eusebius claims it to have been the seventeenth. Bronsen makes their rule end 1639 B. C.; Lipsius, 1842 B. C.; yet if we place the discovered date of Thothmes III. (1445 B. C.) in his sixteenth year, the close of the Hykshos dominion must have been about 1500 B. C.

"In my early life I set about the task of reconciling these discrepancies by converging lines of testimony; and so satisfactory were the results, so unerringly was each cause deduced from its many effects, that I conceived the idea of not only reconciling historical discrepancies as to occurrences and motives, but reading the future by continuing each chain of reasoning into the time to come. In other words, if by my inductive method, more light is thrown on the occurrences in Babylon, Media, Lydia, Egypt, twenty-five centuries ago, than by the non-inductive method, upon those at Shiloh, but twenty-five years past, it should be safer to predict by it the outcomings of the next generation, than by the usual methods, those of the next spring or summer. I deemed that 'by labor and intent study (which I take to be my portion in

this life) joined with the strong propensity of nature, I might perhaps leave something so written to after times, that they should not willingly let it die.' Each year that I continued my studies, which embraced not only the collection and assimilation of facts, but their classification and the formation of deductions therefrom, the more firmly I become impressed with the idea of turning the electric light of induction along the path of prophecy, rather than merely illuminating therewith the fogs of history.

"'I, thus neglecting worldly ends, all dedicated
To closeness, and the bettering of my mind,'

set about this problem. Ample means, an excellent constitution, and correct and regular habits, have enabled me to accomplish during the past fifty years—for through so long a time have I been striving for my object—much more than is given to most men to do, and more even than I had given myself reason to expect or hope. We now stand in 'this narrow isthmus 'twixt two boundless seas, the past, the future, two eternities.' I HAVE EXPLORED THEM BOTH.

"But I detect in your manner an impatience which I cannot condemn, and shall plunge at once into an explanation of my methods, leav-

ing until later a statement of what I have been able to accomplish thereby.

"It has long been the custom of professional engineers to represent graphically on sheets of paper ruled in squares, various properties of matter under regularly-varying conditions. For instance, to show the electric conductivity of wire at various temperatures, horizontal strips represent degrees of temperature, and vertical strips, degrees of conductivity; and if a line connecting points corresponding to conductivity at various temperatures be convexly curved above, it shows that conductivity decreases more rapidly than temperature increases. If the line be straight, it shows that conductivity decreases in the same ratio as temperature increases. The use of several colored lines, or of solid and of variously broken or dotted lines, permits comparison of the conductivity of several metals or alloys.

"This, as a method of recording and comparing experiments, is quite convenient; but it is even more useful. The location of from three to ten points permits the experimenter to deduce accurately what would have been the results of other accurately-performed experiments under

similar conditions. Whether the line is a straight one, or an hyperbola, or one expressed by some algebraical equation, the mean can be known from the extremes or one of the extremes deduced from the other extreme and the mean. In other words, *in this principle lies the key to prophecy.* For, given a mode of expressing social conditions, legal enactments, human emotions, extending through a sufficient period, and known with sufficient accuracy to be properly charted, *the present may be made to throw light upon a past too dim, and past and present point with unerring finger to the future, be it near or distant.*

"When Byron wrote 'The best of prophets of the future is the past,' he 'builded better than he knew.'

"But that the scientific seer may surely venture on the task of piercing the fogs which screen the past from our curious eyes, or of lifting the veils which hide the future from our anxious gaze, the simple squares and lines of the engineer must be so developed and supplemented as to represent more than two sets of conditions at once. They must show simultaneously several influences which are silently making history.

It is to the enlarged application of the principle of graphical representation, that the last ten years of a life, formerly spent in the accumulation and classification of recorded knowledge, have been devoted. How well I have succeeded, I shall shortly show you. But first I must tell you by what means I have triumphed over oblivion and set upon myself the crown of prophecy.

"In these charts and relief maps, horizontal distance represents time; vertical distance, space, or sections of country. Red, yellow, blue and black lines permit recording four social or other conditions at once, while elevation and degree of roughness of surface add two more to the number simultaneously expressible.

"As a simple instance, this chart is devoted to the Sacredness of the Marriage Relation, from the year one of the Christian era to the present day. The portions to the left indicate early periods, those in the centre, present time; those at the right, time to come; each decade being represented by one-half inch of length of the chart. The various strips are devoted to different geographical divisions; that given to

our own country being sub-divided into strips corresponding to its various States and Territories. The depth of red tint shows the degree of respect or disrespect for woman; blue tints correspond to enactments rendering marriage more sacred, divorce more difficult, the rights of women more general and acknowledged. Thus we see in this blood-red quarter to the left, an indication of promiscuity in the sexual relation. The lighter red stands for polyandry, or that state in which the woman has several husbands, living peacefully together. This is due to a scarcity of women, owing to the female infants being exposed at birth or sold as slaves.

"Note that in Great Britain, in the time of Julius Caesar, this form prevailed; and that it continues up to the present day in the Neilgherry Hills, India, and with the Herero tribe of South Africa. It appears in greatest perfection in some tribes of Thibet, where all the brothers of a family have but one wife in common.

"Here among the Eskimos, Aleutians, and Kolushes of the north and northwest coasts of America, we have still a marked red

stripe, due to the fact that among these tribes a married woman is the wife of all the married men of the tribe, and each married man is the husband of all the married women—which does not, however, prevent the distinctions between the married and unmarried being rigidly observed.

"This state is followed by polygamy, indicated by a lighter shade of red, and which accounts for this local patch in the Utah strip, nearly down to 1890.

"Monogamy is rare among the ruder races, but this strip of paler red in Ceylon is to represent the Veddahs, where each male takes but one wife, and is true to her alone until separated by death.

"Almost simultaneously with the fading in the red tint, which fading represents increasing respect for women, we have a deepening of the blue tint lines which stand for ecclesiastical and legal protection of the marriage relation and of the rights of woman. Thus we see the chart changing from deep red to reddish purple, from this through purple to bluish purple; and the future shows deep blue as indicating the absolute recognition, formal and social, of all

woman's claims to honor, protection, and property. See now, from the year 400 A. D. on to the right, a sudden deepening of the blue, indicating the canonical law pronouncing a marriage indissoluble—as is still the law in the Roman Catholic Church.

"Note here local differences of color due to the fact that among the Shawnee Indians the women, while the only drudges, yet own all the property; and that among the Osages of our Western plains the oldest daughter on her marriage comes into possession of all the family property.

"In our own country, see the extra blueness of South Carolina, which has no divorce laws; of Georgia, in which absolute divorce is granted only after the concurrent verdict of two juries, at different terms of the court; and of New York, where it is accorded for but one cause only—adultery. See how the blue is paled in the District of Columbia and in Wisconsin, where the granting of divorce for any cause is practically left to the discretion of the Court. See how feeble the blue in Illinois and in Rhode Island, yet note how it is overwhelmed by the other strips, so that it is safe to predict that by

1925 those States will have been compelled by pressure of public opinion to enact and enforce laws more thoroughly protecting women. This we must read in connection with the chart showing centralization of government and uniformity of legislation in America, and with that one showing the increase of Roman Catholicism in the State of Illinois, and in its neighbor Missouri.

"In the same way I here show graphically the evolution of recorded speech, from thought-writing by pictures—as practised among the American tribes, particularly those of Mexico and Central America, in China and the valley of the Nile—to sound-writing as first done by rebuses, and the cuneiform method of syllabic writing in the Valley of Mesopotamia; then alphabets proper, first non-phonetic as adopted by the Hebrews, Greeks and Romans, and by ourselves; then phonetic, which the rapidly increasing rate of increase of the yellow lines representing the phonetic principle shows will soon become universal.

"This method—scientific, accurate and complete, in conception and execution—has enabled me to foretell accurately the condition of

men, manners and matter on this earth fifty, a hundred or a thousand years from now.

" 'By this time, like one who had set out on his way by night, and travelled through a region of smooth and idle dreams, our history now arrives on the confines, where daylight and truth meet us with a clear dawn, representing to our view, though at far distance, true colors and shapes.'

"Although I am strong and lusty for my years, the span of my life is drawing to a close, and I have so far been able only to record as a test prophecy, the conditions which will prevail half a century from now.

"With a portion of this history, impartially written in advance of the events therein recorded, I now entrust you, that you may the better enter into the spirit of my life work. The roll which I here hand you, contains a fragment of history which will be true when you have attained my age of three score years and ten.

" I am desirous of a helper who shall not only aid me during my lifetime, to record events, but carry on the wonderful work, when these eyes shall long have been sightless, these hands

but useless dust. Should the concise prophetic record which I here give you attract your interested attention, and the bold and original method by which it is attained win your confidence, I should be glad to have you become at once my assistant, and eventually my successor.

"The key to the method I have long ago reduced to writing, so that in case of my death, before imparting all the details to any one, the science and the art of scientific prophecy shall not die with me, but shall live forever, like my own immortal soul."

Taking the manuscript, with an eagerness which I could scarce conceal, I expressed my appreciation of his confidence and good will, no less than my admiration of the wonderful method by which mere dots and lines, veriest material and mechanical exponents, should reveal the secrets of things past and to come.

The venerable professor bowed me courteously from his presence, and quitting the old mansion, depository of so much knowledge, of so many hopes, I was soon within earshot of the rattle and roar of the great city.

"Above the smoke and stir of this dim spot,
Which men call Earth,"

the glittering starlight beamed—but I heeded it not. A few minutes' brisk walking brought me to my own door, my hand clutching, through the thin cloth of my light overcoat, the precious roll which contained that record, more precious than the chronicles of kings long since vanished into thin air; for was it not the unrolling of the time to come—my future, Estelle's, and our children's? What glass cases filled with registers of dynasties of the long ago; what sarcophagi, enclosing the mortal remains of monarchs and sages who swayed the earth's destinies when time was yet young; what crumbling rolls, or incised cylinders, bearing enactments which shook nations to their foundations, achievements which reduced whole peoples to abject slavery, so interesting as these soft, closely-written pages, on which I—I alone now of all mortals on earth—was privileged to hear the happenings of the time to come? What treasury, with walls bursting under pressure of silver bars and golden ingots, with cabinets enclosing priceless jewels—so valuable as those squares of paper, from which those records were compiled, yet which a vagrant spark could reduce to nothingness?

I sprang up the stairs, three at a time, with my brain on fire, my eyes wide open, glistening; the blood throbbing in temples and tingling in finger tips. Like Monte Cristo, I felt that the world was mine.

So eager was I to know with what the womb of the future was pregnant, that I disregarded, in favor of my excited mind, the claims of my wearied body; and forgetful of the fact that I had eaten nothing since morn, I pondered far into the night over the revelations of the wonderful manuscript entrusted to me by my wonderful new-found friend.

Omitting some introductory portions which consisted of practically the same partial explanations as to methods, which Brathwaite had given me orally, I give this manuscript entire.

FIFTY YEARS HENCE.

WARWICK:—There is a history in all men's lives
Figuring the nature of the times deceased:
The which observed, a man may prophesy
With a near aim, of the main chance of things
As yet not come to life: which in their seeds
And weak beginnings lie intreasured.
Such things become the hatch and brood of time:
. . . . . *Henry IV., Part II., iii., 1.*

With my feet planted on the one thousand eight hundred and ninety-third step in that part of time's imperishable edifice which has risen since the birth of Jesus, the Blessed Nazarene, and my head above the clouds of five decades which hover above it, I, Roger Brathwaite, read as upon a printed scroll the yet-unwritten records of the year 1943. These I have reduced to writing as an earnest of what may come when my system of verifying and completing history and of anticipating the future shall have been carried out as fully for five hundred years as for fifty years to come.

I see around me the millions of this year 1943

as people of the time in which I live—or rather find myself so transported mentally that the events of fifty years from 1893 onwards are as of the past. I see the households and the nations of 1943, and with them hold plain converse in the universal tongue of the Electric Age; for the language written, and to a great extent spoken all over the civilized world, is everywhere the same; having been prepared by a committee of philologists of all countries, and formally adopted at a congress held in Paris in 1915. It combines the soft liquid beauty of the Italian, the dignity of the Spanish, and the majesty of the Greek; the adaptability to new ideas of the German, the delicate shadings of the French, and the business-like exactness of the English. Its spelling is phonetic; and phonetic printing is as common as phonographic writing.

The written language has been greatly enriched by characters to represent signs which in the year 1900 could not be expressed in writing or in printing; as, for instance, whistling, clucking and kissing, barking, howling, groaning, laughter, etc. In fact, every sound which can be imitated by the human voice may be so

recorded upon paper that it can be read and reproduced by any one (not dumb) who can read and write.

The theatre is the great preservative of the purity of spoken language, both in grammar and in pronunciation; each great actor being an *arbiter elegantiarum* in matters of speech. Censors hold all public speakers to a high standard of pronunciation and diction; and the study of grammar, while pursued by the more highly educated, has been largely done away with by reason of purity of speech being attained by force of example and criticism.

The use of the typewriting machine is universal, the machines printing phonetic characters exactly the same as those used in book and newspaper work, with variable spacing, and justifying perfectly. These machines are so arranged that they may be connected with the telegraphic system; so that a letter may be written in New York or in Paris by a person in Chicago and Melbourne; and all books of record are written in by machine only.

Writing is phonographic or phonetic, only; each word being composed of as many characters as there are sounds therein; no two sounds

having the same character, and each sound having but one letter.

Printing has become one of the most noble of the fine arts. Photographs in half tones are printed by every daily, and printing in natural colors (for many years a common feature of the book trade), is beginning to be adopted by the more enterprising. The boundaries between lithographic and relief printing have been largely broken down by zincographic and other processes; the speed of impression more than quadrupled, while the sharpness of fine lines and the blackness of masses are as perfect as formerly in etching and line engraving. In these latter branches great progress has been made, both in speed of production of the plate and in the rapidity of printing therefrom.

There is wonderful advancement in telegraphing, pictures and fac-simile documents being sent over the wires, when wires are required; although in most cases wires are not needed; and what few there are, lie hidden from public view. There are, indeed, some inventors so expert that they can telegraph pictures in natural colors, taking advantage of the great improvements in photography, by which any object

can, at one exposure, be photographed permanently in its proper colors.

By the new system of telegraphic printing, news is set up in several cities simultaneously, in column width, all ready to be worked off on the great hourly papers, which with their beautiful colored illustrations, are a marvel as well as a convenience.

A newly-discovered process transmits from the scene of any great event, as a conflagration, convention, or battle, an accurate photograph in colors, which is reproduced in one or a hundred cities, there to be printed in the local journals, which latter have become, in fact, hourly bulletins of the on-goings of the neighborhood and of the world at large.

Telegraphic and telephonic communication with moving railway trains has been for forty years an accomplished fact, so that the business man, desiring to keep up his correspondence from and with his office, while travelling, can readily do so; and may, in fact, from time to time, talk with those at home; while a statesman may from his seat in a pneumatic or electric railway car, address his fellow-legislators in session assembled.

Vessels at sea may be communicated with by both telegraph and telephone, no wire being employed. Soundings are automatically indicated and recorded as the vessel moves along, so that the log not only is made up as the voyage progresses, but serves as a chart to guide the course.

In the homes of the masses as well as in those of the millionaires, there is little of comfort or convenience to be desired. The luxuries of 1893 are the necessities of 1943; while to these have been added refinements undreamed of fifty years before.

Houses made of concrete in one piece, without joint, defy wind, storm and the intrusion of "rats and mice and such small deer."

In every house, there is a system of piping and wiring by which heating-gas, lighting-gas and oxygen; hot and cold, salt and fresh water, steam and electric lighting and telephone service are laid on; while thorough ventilation is effected by a system of exhaust operated from a central station. The sanitary appliances are under control of the municipal authorities; and disinfecting solutions are as necessary a part thereof, as the supply of fresh or salt water which flushes out the waste-pipes.

The law, which is the conservator of health as well as of morals and of peace, compels every house to have bathtubs in proportion to the number of people living therein; and bathing is practically made compulsory. Public baths in which, as in the days of the ancient Romans, men meet for social converse and the transaction of business, are maintained in every town of any importance; medicated and electrified plunges and showers being under the management of experts in hydropathic sanitation.

In the houses of the wealthy, and in the clubs, the opera is "wired on," just as hot and cold water, warm and cold air, electricity, and other conveniences are in the same way "laid on." In fact, the celebrated preachers are heard by those who prefer to stay at home; every one may sit in his or her chair and get the utterances of the most distinguished orators as well as of the most celebrated singers and musicians.

As noted under another head, law-givers and public officials listen to and address their confrères, their colleagues and their constituents, at all times and in all places; from their homes, from public baths and from public conveyances; so that the Senator from Oregon may address at

the same moment both Houses in the Capitol at Washington, while preparing in the intervals of his private business and local political matters, to make a campaign speech in the Mississippi Valley, without leaving the shores of the Pacific.

All new houses are monolithic and must be built from plans approved by the General Council of Architects. The law requires, under heavy penalties, that every building shall have a liberal and specified window-area, and be properly warmed and ventilated.

The new system of diffused daylight is by most preferred to electricity. The panels with which the walls and ceilings are covered, have a power of absorbing sunlight all day and giving it out at night, thus making the rooms pleasantly bright by night. All beds are enclosed in beautiful cabinets (connected with the general system of ventilation), so that one steps from a bright chamber into his comfortable sleeping-compartment, and there, lulled by sweet music, if he so wish it, sleeps the sleep of the happy dweller of 1943.

The compartments are warmed, as the occupants prefer, by warm air from the general sup-

ply, by electricity from the common central station, or by heating-gas manufactured at a distance from the city, and pumped through long miles of pipes to where it is needed.

The streets are lighted with a soft, well-diffused illumination, bright enough to enable reading from ordinary print, at any point. The electric wires which carry currents to supply the lamps, are invisible. Each house contributes its quota to the illumination, by electric glow-lamps over its doors and windows, so that the effect, upon a moonless night, is fairy-like.

The sea-board cities have salt water "laid on" for bathing purposes, street-washing and use at fires; although the methods of fire extinguishment have greatly changed for the better. Few fires are possible, and those are generally put out by chemical vapors, automatically discharged from pipes placed in every room and passage.

The results of paternal oversight as carried out by republican institutions, are most gratifying; the annual death-rate being reduced to about 7 per thousand in sections favored by Nature, and never exceeding 10, in the most crowded districts and those least blessed in climate.

Medical science and art no longer work blindly; no longer act hap-hazard.

The average life of man (largely, let it be said, due to the efforts of the life insurance companies in enforcing sanitary improvements and in fostering medical and surgical research), has been about doubled. Surgical operations which fifty years before were deemed chimerical or impossible are now, thanks to the improved anæsthetics and antiseptics at command, performed most frequently; so that laparotomy, the Cæsarian operation, bone-grafting, removal of diseased portions of the brain and extirpation of the kidneys, and their replacement by those of the sheep or calf, are common and successful.

Acute disease is treated almost exclusively by heat, cold and electricity. The subcutaneous injections discovered, or rather foreshadowed, by Brown-Sequard, have been brought to such pitch of perfection that by their use the vigor of forty is maintained until eighty or even ninety years. The noble work of Koch in subjugating pulmonary consumption has rendered that dread disease no longer contagious, while brighter light upon the mode of living, and improvements in

comfort at home and when travelling, have made safe for consumptives many climates in which formerly no one with predisposition to lung trouble could live. The sanitary precautions enforced by local and National bodies have completely stopped and prevented the ravages of typhoid and other filth diseases; while the terrible effects of such epidemics as the grippe are made impossible in the face of the medical knowledge of the twentieth century.

Transfusion of blood is accomplished, in case of wounds by accident, without inconvenience to the one supplying the life-fluid, or danger to the recipient, while effective tonics bring about the rapid replacement of the amount of blood abstracted in the emergency.

The triumphs of electricians in their wonderful science have caused the twentieth century to be named the Age of Electricity.

The power of great rivers, such as Niagara, is utilized by being converted into electricity and transmitted where desired; also stored up at convenient distributing places, to be used when wanted. Wave force has been taken hold of and similarly carried to great distances and used in quantities, or at times, to suit.

The wind and the lightning are in the same way harnessed to do man's bidding; so that each storm contributes to public wealth to an extent greater than the damage it works.

Lightning is no longer a source of danger. The electric and other connections of the building render an injurious shock impossible; and where it does strike any building in the protected circuit, the charge is stored to be used for domestic purposes, such as driving the passenger and goods elevators in the house, or furnishing light and heat.

Welding is accomplished by electricity, on a large scale. Not only are ordinary masses of steel so made one, but the hulls, masts and yards of steel vessels are thus welded together electrically, so that there is no possibility of a seam "giving," nor of a leak taking place. Steel bridge-members being similarly electrically welded together, the danger from such bridges giving way is reduced to an insignificant minimum.

Primary batteries generate an electric current by chemical action upon coal, without the production of heat or odor; so that the steam-engine is seldom needed, and, indeed, in many places as

rarely seen as the wind-mill was in 1893.

Horology, as of old, is one of the exact sciences; but we find upon every street, electrically-driven clocks telling to the tenth of a second the time of day or night; the twenty four hour system having come into general use about 1900, and London time being kept in every city in the civilized world.

The central stations of the telephone and other conveniences are worked by the subscribers themselves; the apparatus in each house enabling the subscriber to ascertain whether or not the person with whom he wishes to communicate is at liberty; and to connect with him if he is.

All cities on the Continent are connected in a universal telegraphic and telephonic exchange, so that San Francisco can write, print or talk in New Orleans or Montreal. The telephone is so improved that it can be worked across the Atlantic, although the Pacific as yet defies all attempts of inventors to produce a system that will work without fail under all conditions. By this wonderful improvement Patti, from her castle at Craig-y-Nos; Campanini, from his beloved Italy, and other celebrated artists, could

have delighted those who heard them in New York, by taking part in a concert together; but those great artists are but memories, and have been supplanted by others, with voices improved by surgery and special nurture until their range, delicacy and power have been brought to a degree of perfection of which the nineteenth century never dreamed.

The chemists have not been far behind the electricians in their triumphs and successes.

The subject of special plant foods has been, during the past forty years, taken up by agricultural chemists with such results that not only can any special plant be given its special food, but special portions of it can be developed in disproportion to the rest; thus, oranges and lemons can be grown without seeds, and dwarf wheat practically without any straw. New varieties of food-plants have been developed from wild plants, while fertilizers are employed to dissolve the rocks that are in the soil and render them at once absorbable by the plant roots.

In metallurgy, surprising progress has been made. Several new noble metals have been discovered in the Ural Mountains and in Africa, giving scientists and jewellers a variety in color,

hardness and weight, as surprising as pleasing. The manufacture of steel direct from the ore has become *un fait accompli.* Iron is used for few purposes, steel being cheaper and better. Aluminum, which is plentifully extracted from common clay, has taken the place of steel and bronze for many uses, in fact for all places where great mass is not practically a requisite.

The chemist is even more ingenious and more of a benefactor than his predecessor of the nineteenth century. He has produced from coal oil, in paying quantities, both sugar and vinegar; and has also solved the problem of making sugar from starch.

The majority of fabrics are rendered, by chemical processes, proof against fire and mildew; and the law renders the use of such fireproof substances compulsory where wood, cloth or paper is used in building construction.

Medical and chemical science has so far advanced that special foods are devised for particular parts of the body. The man who uses his brain employs certain condiments; he who gains his living by the sweat of his brow others, and so on.

Foods are concentrated to a degree once

deemed absolutely impossible. A vessel can carry in a small chest, which two men can lift, a week's supply of nourishment for five hundred people.

Antiseptics of pleasant taste and non-poisonous character permit the preservation to almost illimitable extent, of heretofore perishable foods.

The profusion of new dyes is so great that industrial chemists have, by common consent, restricted the output of shades to enable buyers and manufacturers to keep up with the pace. The shades for each year are announced in advance two to five years ahead. Among these dyes are many which have a sheen truly metallic, thus producing effects never before dreamed of outside of Nature's laboratory. The butterfly and the peacock are out-rivaled; the gorgeous beauties with which Brazil abounded before her more complete settlement and civilization, cast into the shade. Truly "Solomon, in all his glory, was not arrayed like unto one of these" might the on-looker say on beholding a bevy of young girls, clad in the latest spring fashions.

There have been produced numberless new

alkaloids having medicinal effects of character as various as the sources and methods of production of the drugs themselves.

The four haloids, iodine, bromine, chlorine and fluorine, have long been discovered to be allotropic forms of one and the same simple element; and the relations between carbon and boron, and carbon and silicon, have been traced to such a degree as to render possible the production of new steels and other alloys, comprising a range of properties undreamed of in 1893.

Diamonds are no longer precious stones, since they are electrically deposited in great quantities at trifling expense; as are, of course, all other stones once styled precious.

The dead are disposed of by cremation in gas furnaces, or by dessication; and the establishments for performing these operations, and for disposing of the remains, are under strictest governmental supervision.

The use of explosives—confined to peaceful operations since war has been voted too expensive—has largely increased; and there are numbers of them which, while explosible only by electricity applied in a particular way—thus

preventing possibility of accident—have a force which throws into the shade all the dynamite and other explosives of the preceding century.

The clothing worn by men is very little changed from that of the century previous, except in texture and materials. Numberless plants of Mexican and African origin have been brought into use as bearing textile fibres; and improvements in spinning and weaving have enabled the production of fabrics of most surprising fineness and strength. The silk hat, which was the pest of civilized men in the previous century, has given place to a modification of what was once known as the Alpine, save that the new head-covering is lighter and more graceful, and those employed in winter are warmer than the others. In summer, straw has been superseded by paper. The women have decided upon a dress in external appearance not dissimilar to that which for so many centuries made Japanese women so picturesque. Corsets have been abolished, and pictures bearing date of the preceding century, in which the bustle is a prominent feature, have been tabooed as suggestive if not indecent.

The manufacture of paper has so greatly been

improved, that sheets are now used of only one-half the thickness formerly rendered necessary for any purpose; and of finish as marvellous as their strength. Leather possesses a suppleness, a resistance to wear, and a beauty and variety of grain, as surprising as desirable, while it is not only waterproof, but permeable by the perspiration of the foot.

Iron and steel may be cast into the thinnest sections and the most complicated forms.

Flour-making is accomplished by air blasts to perform the disintegration of the wheat grains, with electrical separation of the various useful by and waste products. But the new-process bread is made directly from the decorticated wheat berry, without ever grinding it into flour; the baker taking the wheat and doughing it up directly without ferment.

Timber is dyed of any desired color before felling, and bent into any shape by steaming, so that the most complex outlines may be given it without weakening it.

Umbrella covers and other textile objects of irregular shape, formerly made up of gored sections, are now woven in one piece and of any desired fineness. Rugs and seamless carpets an

inch thick and of infinite variety in pattern are produced with any wished-for outline, to fit the projections and recesses of the apartment for which they may be ordered.

Flexible and malleable glass are no longer scientific curiosities; and toughened glass bells break the night's silence with their sweet chiming of the hours as they fly.

In porcelain and other ceramic wares the long-lost arts of the ancients have been rivalled or revived; and the most exquisite productions of the Land of the Rising Sun duplicated or excelled.

In brewing and wine-making all hurtful compounds are eliminated, and none but the health-giving and gladdening retained.

In mechanics an entirely new principle has been applied; the cold of winter, as well as the heat of summer, being harnessed to do man's work. The scientific engineers of 1925 recognized the fact that in any motor it was the difference between the initial and final temperatures of the steam, gas, or other medium employed, that did the work; this work being the utilizable percentage of that difference in temperature; and acting upon this idea, by 1935

there were engines which ran by cold as well as those driven by heat. The snow-fields of winter then, as well as the great arid plains of summer, have for some time been used to make and store up power, which is used only as wanted.

A striking landscape feature is the great number of windmills, stately, picturesque and beautiful, which lazily flap their sails or merrily spin with the brisk breeze, generating and storing up power for the houses upon which they are perched. These mills are let run full speed in the fiercest storms; the surplus of power going to the owner's storage system, to be used when wanted, or contributed to the common stock in case of need.

Railway cars are made very largely of aluminum and paper, thus possessing great stiffness, lightness and strength.

Many new varieties of steel have made their appearance; boron and silicon being used indifferently with carbon in forming combinations with iron, which possesses properties never before seen in steels of any kind.

The hardening of copper has been rediscovered, and for twenty-five or more years this

metal has been tempered and worked just as steel was in the century preceding.

The manufacture of anti-friction metals has been so far advanced that the use of lubricants is rendered unnecessary.

Transportation of the person and of goods, large and small, is as greatly advanced as that of ideas and images.

Steam is a crudity of the past century. Pneumatic and electric railways carry people and freight with swiftness and safety, in all directions and at trifling rates. To every house and from every store, of any importance, pneumatic tubes radiate from central stations, so that packages and messages can be sent from any dwelling or establishment in the system to any other by simply having connection made through the central office, as in the old-fashioned way of telephoning.

Great air-ships hover over city and country, and a weekly line of dirigible balloons, under the auspices of the General Government, is in preparation.

Ocean navigation is rendered both safe and swift. Great floating palaces ply daily between Montauk Point and Bristol, making the Atlan-

tic transit in three days. Seasickness has been banished by medical science, and indeed the motion of the great electrically-driven argosies is so smooth that there would be little danger of sickness even without the remedies. Storms are allayed by the use of oil discharged from these vessels, which now ride the waves in defiance of their strength.

New models of vessels, taken from the marine division of the animal kingdom, have been introduced, and the rivalry between "deep-keel" and "centreboard" vessels, which in the latter quarter of the nineteenth century caused such absorbing discussion, is as nothing to the interest manifested by the advocates of the various models—the "pike," the "swordfish," and so on.

Across all great isthmuses there are canals and ship railways; and projects are under way for a transcontinental ship railway from New York to San Francisco.

The bottoms of all great rivers are paved smoothly and kept clean, so that navigation is never interfered with by bars; and these rivers are sources of health and strength rather than of danger to the cities through or by which they flow.

In every great city there are upon all but the minor streets steel plate-ways carrying electric currents, and upon which the ordinary vehicles run without noise or jolting; although the excellent condition of the pavements would seem to render this unnecessary.

The street paving is monolithic (that is, all in one piece), of an artificial stone as hard as good limestone; giving a surface sufficiently gritty to ensure good hold for the feet of the few horses which are employed, and yet leaving the surface smooth, in order that it may be kept clean and give good traction for the short space of time in which vehicles (which ordinarily take the tracks on the plate-ways) are running over it.

In New York City, Arcade railways, with various ramifications, extend along the main arteries of travel, and give rapid transit to citizens and visitors alike. Double tracks in each direction insure absolute safety, while the express trains, stopping only at principal stations, have their separate way; the local trains, stopping at every block, taking the outer one of each pair of tracks. The motive power here employed is electricity, partly brought on from Niagara and other power-producing stations, and partly

carried along the Jersey and Long Island coasts, where the waves are busy night and day, doing the work of New York and other cities.

The vehicles upon the street are driven by electric power, and the same current which drives them affords light at night to occupant and passer-by.

The plate-ways carry an electric current which may be taken off by those vehicles provided with necessary motors and connecting appliances; so that the horses have little traction to do; and in fact some private vehicles, never going off the streets supplied with plate-ways, have no horses at all.

Other private vehicles are supplied with motors deriving their current from overhead wires, not through trollies as once done in electric railways, but by induction.

Storage batteries that are light and compact have been invented and are already in use for driving carriages along roads which have neither plate-ways nor overhead conductors by which the current can be carried by induction to the motors within the vehicles. The motors for such private carriages are no larger than a man's hat, and are turned out by the thousand

just as Waterbury watches were made in 1893.

In other divisions of the broad domain of science, than those referred to in detail, the past fifty years have been laurel-crowned.

Astronomers have not been idle during the last sixty years or so. They have reached out into space, and discovered enough asteroids to account for the lost planet between Mars and Jupiter; and have supplied the missing link between Mercury and the sun. With the spectroscope they have found in the sun and various planets, several new metals, for which, by analogy they have searched on earth, and many of which they have found.

The geologists, delving into the crust of the earth, have mapped out its entire surface, so that the location of every considerable quantity of gold, silver, iron, copper, tin, coal, oil, etc., is known and recorded, and useless prospecting done away with. The Arctic and Antarctic zones have been thoroughly worked, the open Polar Sea discovered and regularly traversed, and the mines of the Polar regions worked regularly and with profit for metals and minerals used every day in the world's industrial pursuits.

Scarcity of rain in any one place is promptly counteracted by each local government by consent of the others concerned; great fires being started to attract the clouds, which will bring in their arms the friendly drops.

The fine arts of 1943 have kept pace with other branches of culture.

Sculpture and painting, instead of having been thrown into the shade by the wonderful achievements in photography and engraving, have received a great impetus. Leading citizens vie with each other in purchasing (sometimes even in making), statues to adorn their own homes and gardens, and public streets and parks. In the same way painting is taught as a science as well as an art; to be a fair painter being more common than to be a fair performer upon the instrument once known as "pianoforte." The pipe organ has become the national musical instrument, and its glorious tones are heard from houses of far less than palatial pretensions.

The public buildings of this country, no longer laughing-stocks for foreigners, are at once spacious, beautiful, substantial and convenient. In them the new American style of architecture,

in which proportions are of more value than arrangement, finds fitting types on every hand.

In every town of any magnitude or importance, are free museums of science and art, visits to which are as common as to the beautiful parks laid out as breathing places in the larger cities.

Color-masters vie with each other in great kaleidoscopic exhibitions, which out-rival in beauty of rapid combinations and successions of color, the most brilliant pyrotechnic displays of the generations past.

The art of perfumery has been carried to a point never even dreamed of by those of the preceding century. The law steps in and prevents any one from using, or permitting the use of, any odor (like musk) which is prejudicial to health or general comfort. The gamut of odor has been discovered, and harmonies of perfumes are made just like those of colors, or of musical tones. Concerts are given at which the great perfume-masters of the day produce chords and pleasing successions of odors, which draw great crowds of the most refined, fully appreciative of the delights there offered.

Flower-culture is a national pastime. Where

there are no large gardens, small patches are devoted to floriculture; and in the most crowded city, window-boxes hold the latest new hybrid plants and make the most frequented thoroughfares a garden of beauty. Dwarfing and aggrandizing plants, by electric currents passed around their roots, has been practiced for twenty years upon a large scale; so that in the great conservatories, one may find tiny plants grown from the cones of the Yosemite great trees, and may also see what have sprung from tiny fungi but are now as large as the old-fashioned cabbages of the days of President Harrison. The dyeing of plants and of their flowers by substances introduced in solution at their roots, is a fine art most successful and pleasing in its application.

Banking is much more simple and much more safe, both for the banker and for the dealer, than in the old risky days. Panics are impossible. The wise action of the Bank of England, in connection with other monetary institutions, in averting a financial crash in November, 1890, by coming to the rescue of Baring Brothers with $55,000,000, began most auspiciously an eminently successful era of mutual help. Every

bank is guaranteed by Government, and the notes of any bank in any one Government are good in any country on the globe; the various Governments having treaties to the effect that each shall guarantee to the common banking fund a certain percentage of its revenues, and the amount of money issued in each country being in proportion to the net revenue of the year preceding.

All currency is decimal, and uniform over the whole civilized globe, greatly facilitating travel and commerce.

By an ingenious system the great clearing-houses of each country are united in a National Clearing-house which serves weekly for all those in each city the same purpose as the local establishments do daily for the banks which are members thereof. Similarly, there is in London an International Clearing-house through which the National Clearing-houses all over the world effect monthly clearances. Each city bank takes an equal quantity of certificates in its local clearing-house, so that when aid is extended, no unfavorable inference is drawn; and the same arrangement exists up to the International establishment in London.

The new noble metals Columbium, Africum, Asium and Australium furnish coins ten times as light as those of fifty years previous, while very far exceeding them in wearing power. The paper money extant being of equal value with coin, is in universal circulation, while its cleanliness and general good condition are insured by frequent renewals; every bank of issue and deposit being compelled by law since 1910 to accept torn and soiled notes at par and replace them with others, new, clean and whole.

In most mercantile and manufacturing establishments, profit-sharing is the rule rather than the exception.

Naturally a country so blessed in material and moral wealth would be the objective point of the oppressed and unhappy from all over the world; but there is in the immigration laws a strict clause, carried out most rigidly, rendering the possession of a certain degree of intelligence and education absolutely a *sine qua non* for all who wish to set foot upon our shores. The old law by which contracting for labor abroad was a punishable offense has been so far changed that no one is permitted to land unless

possessed of means enough to support him for three months without work, or having from a responsible party a contract for his labor for half a year ahead. Thus no paupers are thrown upon the community, to be supported by either the working or the leisure class.

The Government takes it upon itself, first to prevent idleness, and second to furnish work to the unemployed; so that there is no vagrancy.

In every city of importance, as well as in the minor towns, the planting of trees on the streets is compulsory; and if a lot-holder does not plant and maintain on his street line the kind and number of trees for which the laws call, they are planted there by the local authorities, at his charge.

Trial by jury was abolished in 1910 with scarcely a dissenting vote; and instead of ignorant or prejudiced juries, learned judges, who hold their office during life or until impeached by their peers, decide questions of law and evidence. The statute-law has been greatly amended, and the common law superseded by principles of equity.

The enactments concerning marriage and di-

vorce are the same in all civilized nations, and their enforcement most strict.

Only the physically perfect are permitted to marry, and stirpiculture is made a common and honored study. The local government being responsible for the maintenance of cripples and others physically as well as mentally ill, keeps strict watch over health and morals. Surgical and other hospitals are kept up at great expense, and any one meeting with an accident, or becoming ill, is treated at the hospital instead of at home.

Elections are held in a quiet and orderly manner; and the cumulative system having been universally adopted in 1904, the minority has a voice in proceedings of local as well as National bodies.

Female suffrage has taken the place of female suffering. The education of the young is largely confided to the direction of intelligent and refined ladies, who consider their educational duties as on a par with those which they owe to religion proper.

The new generations, better educated and better looked after than those which preceded them, find at once fewer inducements to crime,

and more reasons for not committing it; so that imprisonment is not so common as formerly, and execution is far more rare. Asphyxiation by carbonic acid gas is the kindly and unrevolting method chosen.

Trades unions flourish, but their basis is most praiseworthy. The cardinal quality which every member must possess is competence in his trade. No one is admitted to membership in any "degree" of the guild, unless he has been properly instructed and proved capable and competent to do what is called for by that degree of advancement in his craft; and those of the highest proficiency receive pay according to the value of their services. Thus there is confidence in and respect for the trade organizations; and their members have some inducement to excel in their chosen crafts.

In religion, there has been a fusion of the various sects into a vast Church in which Charity in its broadest sense is the leading principle, and the golden rule inscribed upon the mental tablets of all good people. A man's religion is deemed as of his inmost private life; as bearing upon his confidential personal relations with his God, and no more to be inquired into nor dis-

cussed than his most sacred domestic life. Rancor and hatred engendered by religious differences are of the unregretted past, and mission-work, begun at home, and thoroughly prosecuted with a view to physical improvement and mental advancement, as well as spiritual enlightenment, is carried to the heathen on the wings of mercy and healing.

In these blessed days of 1943 each dweller in a progressive community recognizes his duties towards himself, his fellows and his Maker—acknowledges his obligation to be charitable and to contribute to the advancement of all about him. They are halcyon days; they have brought man nearer to himself, to his brethren—who are all the world—and to his Maker, who is everywhere and forever. They point, they surely point, to further steps; to onward steps, to upward steps; to steps which through swift-succeeding centuries shall bring mankind nearer and still nearer to divine knowledge, and make him in each generation more and more nearly the worthy, perfect image of an all-wise and beneficent God.

ROGER BRATHWAITE.

I read this prophecy through without stopping; then gave myself up to the idea of the great possibilities about to present themselves to me. To be sole heir and executor of a property so valuable as this arduous life-work must be, should elate any struggling youth of twenty-two; but to be the mouthpiece of prophecies more wonderful, more far-reaching, more detailed, yet more universal, than any ever before given to the world, be they inspired or uninspired, was enough to turn his head completely. I drew mental pictures, far into the night, limning myself as famous and rich; and incidentally, the husband of Estelle; the father of her children; the founder of a family which should be known throughout the world as that of him who unlocked the gates of time to come; who pierced the depths of futurity; who controlled that knowledge for the right to purchase which the kings of finance jostled each other.

I am ashamed to say that gratitude to Brathwaite, and thorough appreciation of the fact that he was the first to conceive and the first to carry out, even in part, the idea of scientific prophecy through graphical construction, took

in my mind second place to the ideas of that fame and fortune which were to be mine through his industry and generosity.

"Midnight brought on the dusky hour
Friendliest to sleep and silence."

but still I thought on, thought on. At last, tired Nature asserted herself; I fell asleep in the big chair from which I had in imagination seen the magnates of the monetary world feverishly awaiting, in my ante-room, my pleasure as to how much information I would accord them, on my own terms. I slept, to dream of dictatorship of two continents, compelled by my exclusive knowledge of the things to come; but while I ruled as with a rod of iron the doings and the comings and goings of both hemispheres, it seemed as though war's alarms sounded in my ears—the rebellion of a nation from tyranny, be it ever so mild, from dictation, be it ever so wise. The clang of the multitude seeking relief from the oppression of ignorance by knowledge, rang in my ears; I started to my feet to wake and find the fire-brigade jangling and rumbling past my dwelling—the sparks from the steamer's stack streaming upwards and

backwards in the black night as the great engine thundered by.

To the west, a ruddy glow extended up through the murky midnight sky, while lurid flashes rose and fell in horrid alternation. From time to time an angry flame arose, while the harsh clangor of more engines speeding through the almost deserted streets, gave greater terror to the scene.

Fear filled my mind—I knew not why—lest that awful holocaust should be the pyre of my hopes and fortunes. Rushing from my room, and spurred by anxious fears, I soon traversed the distance between my home and the quiet street in which for so many years Brathwaite had labored in the accomplishment of his end and aim—and for my great and ultimate benefit. Hot though the pace, my heart thumped high and hard against my chest, less from the unwonted exercise than from anxiety lest the cup of prosperity had been dashed from my lips before I had tasted its contents.

My fears were but too well grounded. Tearing past the blue-coated guardian of the peace who sought to restrain me, I rushed to a spot where without actual danger, I could best see

the ruin which the fire-fiend was working to me —and of course to Brathwaite—but how can man, born of woman, feel more for his fellows than for himself? Why affect a nobility not of the nineteenth century? Why lay claim to emotions which may belong to those to come—which may have belonged to those gone by—but not of the genius of this eager, selfish present? True, I felt for Brathwaite; but for Ainsworth —for Ainsworth again—and for Ainsworth still again, the pity, the regret, the mad sense of baffled ambition, rose ever up and obscured the finer feelings.

The fire had gained the mastery over the great building, before my arrival, and the principal efforts of the firemen were directed to saving the piano-factory, with its stock of kiln-dried lumber, of costly veneers, and of inflammable varnishes. From that repository of so many almost priceless volumes, so many absolutely priceless chart, and of that Key which should enable the possessor to avail himself of half a century's work by another — great sheets of flame arose from beds of fire. Red sullen gusts, "fierce as ten furies, terrible as hell," bore on their hurtling wings the treasures of a lifetime

—bright, upward-pouring golden torrents, wasting mind and matter at furious rate.

Fierce though the heat, which seemed to crisp my skin even at the distance at which I was stationed, it was nothing to the hot welling passions which assailed my inner self and drove me to despair. That fury of a woman scorned, than which hell no greater hath indeed, was as nothing to a man so baffled in ambition, which

> "hath one heel nail'd in hell,
> Though she stretch her fingers to touch the the heavens."

Demoniac rage possessed my soul—I was frenzied to the verge of insanity, and as the crash of that roof-tree which had shielded the light of prophecy and covered my hopes, if but for so short a time, sent scintillations up and out, far and wide, I rushed from the excited scene, I knew not whither.

* * * * * * *

When I next recognized my surroundings, I found myself in a small, neat room, white-walled and curtained—and Estelle's anxious face was bending over me. I had been ill a month, and my gaunt limbs and haggard features, which I insisted on seeing in a mirror,

gave no reminiscence of my once plump face and rounded form. My voice, the mere ghost of a sound, was hardly the semblance of its former resonant self.

At first I was not permitted to excite myself by too eager inquiry, but as I gained strength, those about me, who of course had known nothing about my intended collaboration with Brathwaite, set to work to ascertain something concerning the events of that September night in which I had been so swiftly snatched up to the seventh heaven of expectancy, and as suddenly dropped to earth again.

There was nothing reassuring in the tidings of a month ago. The enthusiast, roused from slumber by the shrill cry of fire, sought to save his papers rather than his person; traversed passage after passage claimed by the invading flames; and bore treasure after treasure to the lower hall. But in penetrating to some distant stairway, which gave way under his daring footsteps, he inhaled flame, and although rescued by the bravery of the firemen, was borne from the seething, roaring furnace—only to die.

So, then, the manuscript which the noble soul

had entrusted to me, as an earnest of what was to come, was all that remained of a life of work, a fortune of expenditure.

"Then black despair.
The shadow of a starless night was thrown
Over the world in which I moved alone"—

I could without a sigh "let the dead past bury its dead," but the future which promised so much for me and mine—how could I bear to give it up?

The attending physician, who gathered that I had met with some sudden business reverse, said soothingly: "Remember this line of Shakespeare:

"'Sweet are the uses of adversity,'

and this which Beaumont and Fletcher borrowed from Seneca:

"'Calamity is man's true touchstone.'

This trouble, great though it be, may be like the heating in molten lead and quenching in cold brine which gives to steel its greatest hardness and most exquisite temper. Everything is for the best."

With this I could not agree. I am not sure that I agree with it yet. I replied, peevishly: "It is very easy for you to console me; to patch

grief with proverbs. But I can quote you Shakespeare against himself:

"'Tis all men's office to speak patience
To those that wring under the load of sorrow,
But no man's virtue, nor sufficiency,
To be so moral when he shall endure
The like himself.'"

Pope says, 'I never knew any man in my life who could not bear another's misfortunes like a Christian.' While I do believe that I should make the best of everything, I do not believe that everything is for the best.

"'Yet I argue not
Against Heaven's hand or will, nor bate a jot
Of heart or hope; but still bear up and steer
Right onward.'"

Estelle said, half-reprovingly, "'If thou faint in the day of adversity, thy faith is small.'"

"I never pretended to have faith. I never thought that I had any, except perhaps when none was needed. Faith is like courage; it must be born in one, or be cultivated by contact with danger. When there is no danger to test one's faith, there is no means of knowing whether or not any has been born with one. Then when faith is most needed, it may be found entirely lacking."

With such thoughts and words our conver-

sation continued until the physician, mindful of his patient's physical welfare, signed to Estelle to leave me—which she did, pressing on my pallid forehead a soft, tender kiss that meant hope and love, confidence and reassurance.

A soothing draught composed me to dreamless sleep, and when again I woke it was to see the love-light in my dear one's eyes, patiently watching my restful slumber and awaiting my return to consciousness.

Her gentle ministrations, as much as the doctor's skill, restored health and strength to my enfeebled mind and body. We tacitly avoided the subject of my so-suddenly blasted ambitions, and talked of love and happy life together, in a pleasant uneventful future, such as had often engrossed our conversation before my eyes had seen from afar that promised land which I was never to enter.

With returning vigor, I renewed my former plans for my future and Estelle's; but as my steps increased in firmness, my thoughts still reverted to Brathwaite's wonderful prophetic manuscript, some of the details of which I set about to make realities of the present, rather than of a generation hence. The hope of real-

izing for myself and Estelle an early return from my mental labors in their development and embodiment, lent new strength, suppleness and deftness to my touch, and seemed to make my insight keener, my inventive powers more fertile, more promptly responsive to the demands upon them. *Festina lente* became my motto. I doubted as I hoped; I criticised relentlessly as I solved method after method, and produced result after result. At each new step I felt the ground firmly before trusting to it; I looked at each production as though it were that of some hated rival whom I had in my power to thrust down, keep down, by savage search for faults and merciless exposure of each weakness in design, construction or operation.

The news of the dramatic death of Brathwaite and some inkling of the fact that he had for so many years been engaged in scientific research, every vestige of result from which was believed to have perished with "the old Professor"—as the journals of the day styled him—had startled the city; and gave three-column stories, spread headed, sub-headed and padded *ad nauseam;* no two agreeing, save that in all "the fire-fiend" was rampant; "holocaust" and "pyre," "cre-

mation" and "conflagration," vied with each other in harrowing up the reader's nerves. The suburban press took up the strain in more subdued tones and in less space, although no more grammatically — while the far-away sheets of Boom City or Dead Man's Gulch paragraphed it as the shocking self-destruction of Robert Batterman, an eccentric metropolitan hermit who had a mania for collecting old almanacs and back numbers of periodicals. "Such is fame," said Byron, "to have one's name misspelled in the 'Gazette.'"

The Masonic body of which Brathwaite had been for so many years an unobtrusive member announced a Lodge of Sorrow in memory of the deceased brother; and most imposing were the ceremonies, most impressive were the addresses upon that occasion. From the pamphlet account of this function, printed by resolution of the Lodge, I excerpt the remarks of M. W. Past Master Ashley, as showing in some degree the respect in which Brathwaite was held by those who knew him, and the veneration which his upright life, his charitable although retiring disposition, and his many and varied accomplishments, inspired.

EULOGIA.

"My Brethren:—

"'Dear beauteous death, the jewel of the just,' has been laid upon the breast of him who was and is in the Mystic Tie your brother and mine; in every sense, the brother of all mankind.

"I have known him longer than the span of most men's lives, and though our paths have been apart for many years, I have ever been interested to know that his industrious life has been kept unspotted from the world, and that a heart large enough to include all who suffered or were in want, a soul as white as heaven, have ever been the tenants of his earthly habitation. In youth pure and amiable, in vigorous manhood wise, and steady, and just, a serene and bright old age, lovely as a Lapland night, has rounded out the earthly stay of Roger Brathwaite. With him, high-erected thoughts, seated in the heart of courtesy, were ever present. While even in boyhood his thoughts and studies

were what are called philosophical, he never sought to help knowledge overthrow faith, weaken hope, or lessen charity. His youth was chaste and uneventful. That future then dawning and which has become of the silent past, was one of opportunities of many kinds for him, favored as he was in health, in mind, in personal appearance, in social position, and in this world's goods. He could have had a career in which he would have been known and honored of the multitude; but he preferred seclusion and mental improvement to publicity and social advancement. Yet at no time was his retirement so complete as to shut out from him a knowledge of the world's on-goings and of the sufferings and needs of his fellow-men; never did his absorbing occupations close his ears to the cry of the fatherless, or his purse against the appeal of the widowed and forsaken. He craved knowledge as the poet, the artist, crave fame; yet the rich storehouses of his mind were ever open to the inquiry of any earnest seeker after truth.

"He loved mystery only that he might throw its portals open to the light of day. 'A gentleman well-bred and of good name,' honor sat

upon him as the sun in the gray vault of heaven. He sought hidden knowledge that he might use it for the good of men, and eventually make it free as the wind. No covert enmity made him a target; he had no foe but death, to whom he has rendered quittance. He died in full puissance of mind and body. The rude imperious surge has carried him from us, but his bright and shining memory remains. Could I but wish him no better than he wished his fellowmen of all degree, I would breathe naught but blessings and good will.

"What the exact import of his life-work, so suddenly, so unfortunately swept away by the rude flood of fire, I know not; no one seems to know. This only we do know, that he culled from every flower of fact some virtuous sweets of knowledge which he laid up for mankind's good use.

"He leaves no kindred, save that all men are alike his kith and kin. No widow's tears bedew, no orphan's sighs bemoan, his honored grave; yet there is no lack of tears or sighs, for strong men full of years must mourn his death, whose life was all so full of tenderness and good."

* * * * * * *

On a grassy sun-kissed slope overlooking the beautiful harbor of New York, a massive granite cube bearing his name, and the dates of his birth and death, covers the silent tomb of Roger Brathwaite. Peace to his ashes no less than to his daring spirit, which laid bare the inmost heart of the dead past, and would have wrested its every secret from all time to come.

THE END.

PRACTICAL WORKS FOR PRACTICAL MEN,

By ROBERT GRIMSHAW, M.E., Ph.D.

STEAM ENGINE CATECHISM.
A Practical Book for Engine Runners (two vols. in one).....$2.00

ENGINE RUNNERS' CATECHISM.
How to Set Up, Adjust and Run any Engine..... 2.00

PUMP CATECHISM.
A Practical Help to all interested in Pumps of any kind (two vols. in one)..... 2.00

STEAM BOILER CATECHISM.
About 800 Answers to about 800 Questions on the Steam Boiler. 2.00

Practical, complete, up to date, undoubtedly the best.—"*Milling World.*"

Should be an enforced study on every boiler keeper.—"*The Miller.*"

The cheapest technical work we have ever seen.—"*U. S. Miller.*"

LOCOMOTIVE CATECHISM.
All about Design, Construction and Running of all kinds of Locomotive Engines of to-day..... 2.00

PRACTICAL CATECHISM.
A Perfect Cyclopedia of Industrial Facts Wanted Right Away. 1.50

PREPARING FOR INDICATION.
Practical Hints on the Steam Engine Indicator and its Use..... 1.00

HINTS TO POWER USERS.
Practical Suggestions to those who Pay the Bills..... 1.00

TIPS TO INVENTORS.
What Inventions are Needed, and how to Perfect and Develop New Ideas in any Lines..... 1.00

ENGINE ROOM CHAT.
Brim full of Terse Wisdom and Dry Humor..... 1.00

COMMON SENSE GEAR CHART.
Enabling any one to Lay Down Perfect Gear Teeth..... 1.00

—o—

By F. R. BRAINARD, U. S. N.

KNOTS, SPLICES, HITCHES, BENDS & LASHINGS.
128 Figures, and Full Description.....$1.00

Sent Postpaid on Receipt of Price. No Books C. O. D. No Small Accounts Opened.

PRACTICAL PUBLISHING CO.,

21 PARK ROW, NEW YORK.

ESTABLISHED IN PHILADELPHIA, 1873.

ROBERT GRIMSHAW,

CONSULTING ENGINEER & SCIENTIFIC EXPERT.

ENGINES, BOILERS, MACHINERY & MILLS

Designed, Tested, Erected & Improved.

POWER MEASURED.

COAL SAVED ON SHARES.

Investigations. *Tests.* *Confidential Reports.*

Mr. Grimshaw numbers among his clients and references the Governments of the U. S., France and New South Wales, and some of the largest firms and corporations in the world—including the Standard Oil Co., the American Cotton Oil Co., R. Hoe & Co. (N. Y. C.), Silsby Mfg. Co. (Seneca Falls, N. Y.), Société des Forges et Chantiers de la Méditerranée (Paris, Marseilles and La Seyne), H. B. Rathbun & Sons (Deseronto, Ont.), The New York World, the Al. Foster Steamboat Co. (N. Y.), Nescochague Paper Co. (Phila.), Keasbey & Mattison (Phila.), Chalmers-Spence Co. (N. Y.), Crosby Steam Gage and Valve Co. (Boston), Hancock Inspirator Co. (Boston), Dixon Crucible Co. (Jersey City), J. A. Fay & Co. (Cincinnati), Asselin Frères (Paris and St. Denis, France), Hon. Edward Combes, C. M.G., M. L.C. (Sydney and Glanmire, New South Wales), and others.

CONSULTATIONS BY APPOINTMENT ONLY.

Address: 21 PARK ROW, NEW YORK.

BLACK PRINTS.

Inventors, Patentees, Engineers, Architects, Manufacturers, and others having Drawings of which they wish Reproductions made, will find my

Improved Black Prints

(*Sharp Black Lines on Dead White Ground*)

FAR SUPERIOR TO EVEN THE BEST BLUE PRINTS.

This improved process of sun-printing from tracings is neat, clean, rapid, and sure, and as simple as blue-printing. Send for samples, and for prices of materials, or of prints made from your own tracings. Highest references and testimonials.

FERNAND PONTRICHET,

Sole Proprietor,

270 West 115th Street, NEW YORK.

WHY THE

"Grimshaw Catechisms"

ARE SO POPULAR.

The *American Steam Engineer* of New York, which is the official organ of the rapidly growing American Order of Steam Engineers, says in its issue of March 1, 1888:

"The peculiar hold which the Grimshaw 'Practical Catechisms' have on the constituency for which they are intended is due to these facts: They answer at once any question about any kind of a pump or a steam engine that the author could think of or had ever had asked him; are absolutely scientifically correct; practically useful; written in a clear, plain, popular style; up to date; free from hard words and mathematical formulas. Each question is asked by itself and answered in full by itself, thus saving the reader the necessity of wading through a whole book when he only wants to know one thing, but wants to know that right away. The books are plainly printed, liberally illustrated, of a convenient size for the pocket, bound strongly to stand use, and in dark cloth not to show the dirt; are on hard paper to stand thumbing; handy for instant reference; liberally indexed and cross indexed; and explanations are concise, yet very complete. Their author is a favorite writer for the scientific papers; is known to be careful, competent, original, practical, abreast of the times, and able to tell what he knows. They can be drawn on for examination questions by examining engineers who are handling candidates for license, and by examination committees testing candidates for admission to engineering societies. They can be used to coach for examinations by those about to be examined for license, or for admission to engineering societies. They enable competent engineers to improve themselves; help green men out of scrapes without mortification or exposure; prevent accidents and hasten repairs; enable an employer to test a candidate for a job, thus preventing his being imposed upon; and can be used to settle disputes between engineers, as to the topics of which they treat. They describe the construction and operation of every kind of pump; tell how to set up, connect, adjust and start every principal pump in the market, supposing all the parts to have been separated and laid on the floor. Most of the matter is copyrighted, and can be found nowhere else. In case of any trouble, they save delay in sending for, or writing to, the maker or agent of the engine or pump. They are marvelously cheap and have long been needed. If there is any practical questions in the lines of which they treat which is not answered in the latest editions, the author answers such questions free by mail, and embodies such question and answer in subsequent editions or volumes. The advantages of this feature, which is original with the author of these popular books, and (up to date) exclusive, cannot be overestimated."

THE

BUYERS REFERENCE

Quarterly Universal Illustrated Descriptive Catalogues, issued simultaneously to Electric Light and Power Plants, Electrical Supply and Construction Companies and Street Railway Companies; for the convenience of Buyers, and with economy and increased effectiveness to Manufacturers and Dealers.

All Classified and Arranged Most Conveniently for Ready Reference.

To quote a representative Buyer:

"A compact, handy volume, full of information of exceptional value to the buyer, not burdened with matter that does not interest him, and most convenient for reference; in fact, just such a book as I would compile and revise periodically, from standard publications, miscellaneous catalogues, etc., were it not for the time, trouble and expense such an undertaking would demand."

A Complete All-Buying Circulation Guaranteed.

THE BUYERS REFERENCE CO.

(INCORPORATED),

114 Nassau Street, New York.

NOTES ON NEW AND PATENTED INVENTIONS.

In the great struggle after new methods, processes and implements that characterizes our day, and which is a principal factor in our material progress, there is a constant rule of the "survival of the fittest." Opposed to this is the claim, sometimes put forward, that the value of a patented invention is not so much in its intrinsic worth as in the method of presenting and introducing it to the world, or to a market. Both propositions are in a sense true, but with this qualification, that "permanent" success always depends upon intrinsic worth, and while a short success may be attained by a plausible but faulty invention, the future is sure to regulate it to the place it belongs. It is perhaps unnecessary to argue this. Everyone's observation will prove it.

CASSIER'S MAGAZINE, an engineering publication, gotten up in the same style and equal in every respect to Harpers', The Century, and Scribners', has begun a series of articles about "New and Patented Inventions." Many important things are to be considered in these articles, among them that of "added detail." This might properly come under the head of "operative conditions," because it involves maintenance and attendance, but may be made more plain by quoting a remark once made in England by an experienced designer and constructor of machinery. He said: 'The great art of designing machinery consists in leaving out parts and pieces."

The articles will be written by John Richards, in a popular style such as the ordinary inventor and the busy business man can have time to read and understand.

Mr. Richards is President of the Technical Society of the Pacific Coast, and editor of the journal "Industry." There are probably few engineers so well known, or so capable of expressing an intelligent opinion on the various classes of engineering matters, as is Mr. Richards. He has had many years of active and practical experience in the manufacture of machinery, and as a technical writer, and he is known throughout the world by engineers and manufacturers as a man from whom an honest, conscientious, as well as capable opinion can be obtained.

CASSIER'S MAGAZINE—cost, $3.00 per year, 25 cents a copy—can be obtained from newsdealers, or from the publishers, THE CASSIER'S MAGAZINE CO., Potter Building, New York.